NATURAL RESOURCES CONSERVATION SERVICE
NEVADA CONSERVATION PRACTICE SPECIFICATION

TOXIC SALT REDUCTION

(Acre)

CODE 610

PLANNING CONSIDERATIONS

Proper treatment of salt-affected soils requires an investigation to identify the problem salts and to determine the soil, drainage, and other site characteristics. The salt problem can then be placed in one of the following categories in preparation for developing treatment alternatives:

1. Saline Soils

   Soils that contain soluble salts. They are generally recognized by the presence of white salt on the surface. Salt concentrations can be reduced in these soils by leaching.

   EC >4 mmhos/cm at 25°C
   SAR 0-12
   pH <8.5

2. Saline-Sodic Soils

   These soils contain both soluble and insoluble salts. Application of soil amendments along with leaching will improve these soils for plant growth.

   EC >4 mmhos/cm at 25°C
   SAR >12
   pH is usually <8.5

3. Sodic Soils

These soils contain high amounts of exchangeable sodium. Soil amendments are needed to release the sodium from the clay particles. Once the sodium has been released, leaching will improve the soil for plant growth.

EC<4 mmhos/cm at 25°C
SAR >12
pH is usually >8.5

Consider the availability and quality of water needed for leaching.

Water Quantity

This practice requires the application of irrigation water at a rate that exceeds filling the plant rootzone and moves the toxic salts below the rootzone to percolating waters. Toxic salt reduction may have minimal impacts on surface water quantity, with the exception where additional irrigation supplies may be required as a part of the leaching process. The increase in water available for ground water recharge may equal the 'leaching fraction,' less any drainage outflow, which is computed, as a percentage of the water required to fill the rootzone.

Water Quality

Changes in surface water quality may be minor, unless drainage is installed as an associated practice. Increasing irrigation supply may increase sediment, and adsorbed chemicals. The increase may be minimal, because erosion is mainly associated with the first water applied.

Where drainage is used to remove excess water from the rootzone, the increase in toxic salts, soluble nutrients and pesticides in the receiving surface waters will be essentially equal to the amounts removed from the rootzone by the leaching fraction, less the amount that bypasses the drainage system.

The opportunity for ground water pollution from toxic salts is equal to the volume of salts removed from the rootzone by leaching. The salts removed reside in the intermediate zone, or in the case of high water tables, are moved

directly into the saturated zone. Other soluble chemicals such as nutrients and pesticides are leached below the rootzone.

PLANS AND SPECIFICATIONS

Toxic salt concentrations will be reduced to a level at or below the level for the crop/crops being grown. Tolerances for several plants are listed below.

Plant Materials	Upper salinity tolerance mmhos/cm*
Perennial grasses	
Tall wheatgrass	20
Tall fescue	16
Western wheatgrass	14
Fairway crested wheatgrass	10
Creeping meadow foxtail	8
Intermediate wheatgrass	8
Pubescent wheatgrass	8
Smooth brome	7
Orchardgrass	6
Perennial legumes	
Birdsfoot trefoil	7
Alfalfa	6
Cicer mildvetch	6
Annual crops	
Barley	12
Wheat	6
Oats	6

*Electrical conductivity ranges (mmhos/cm): Low 0-4, Medium 4-8, High 8-12, Very High 12+

Planning Criteria for Irrigated Soils

Saline Soils. Adequate drainage of the soil profile is essential to allow for the free passage of water through and away from the rootzone. A periodic high water table will often result in the return of salts. Adequate surface drainage is also necessary to prevent extended periods of ponding.

Adequate drainage of the surface and soil profile is essential to allow for leaching of the salts. Soil amendments such as gypsum, elemental sulfur, or sulfuric acid must be applied to release the sodium. A soil sample analysis and USDA Agricultural Handbook No. 60 will be used to determine amendment requirements. Leaching will be the same as for saline soil.

The application of water for leaching salts out of the rootzone will be designed specifically for each site. Refer to Nevada Irrigation Guide.

Disposal of the tailwater is an important consideration because of governmental restrictions on salinization of surface and ground water. Consideration must be given to the destination of salts once they have been leached from the site. Contamination of ground and surface water will be avoided according to federal, state, and local regulations.

Saline-Sodic and Sodic. Undrained soils must be drained. After the soil is drained, soil amendments in the form of gypsum (calcium sulfate), elemental sulfur, or sulfuric acid may be applied if needed to help leach the salts from the soil profile. Leaching will be the same as for saline soil.

Types and amounts of amendments to be applied will be based on soil sample analysis and availability of the material.*

*USDA Agricultural Handbook No. 60, "Diagnosis and Improvement of Saline and Alkali Soils," pp. 34-54.